REMARKS

Claims 1, 2, 5, and 6 are pending in this application.

In a Final Office Action mailed 21 June 2007, claims 1, 2, 5, and 6 have been rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. Additionally, claims 1, 2, 5, and 6 have been rejected under 35 USC 103(a) as being unpatentable over Applicants' admitted prior art drawing Figure 5 in view of Bhatia et al. (US Patent No. 6,023,724, hereinafter "the Bhatia Patent"), and further in view of Warrier et al. (US Patent Application Publication No. 2002/0116523, hereinafter "the Warrier Publication").

The Examiner rejected claims 1, 2, 5, and 6 under 35 USC 112, first paragraph, as failing to comply with the written description requirement, noting with respect thereto:

> Regarding claims 1 and 5, the limitation in line 9 "assigning selected ones of" is not supported by Applicant's specification, as on page 7, lines 31-33 only disclose assigning a Public and Private IP address to each port, i.e. all ports. There is no suggestion in the specification, drawings or original claims that only selected ports might be assigned a public IP address.

Applicants have corrected claims 1 and 5 to address this rejection and believe that independent claims 1 and 5 are now allowable under 35 USC 112, first paragraph. Since this removes text added in the last response, it does not require additional consideration by the Examiner, since Applicants are following the Examiner's recommendation.

The Examiner rejected claims 1, 2, 5, and 6 under 35 USC 103(a) as being unpatentable over Applicants' admitted prior art drawing of Figure 5 in view of U.S. Patent No. 6,023,724 issued to Bhatia and further in view of U.S. Patent Application Publication No. 2002/0116523 by Warrier. The Examiner noted with respect to claim 1:

> Figure 5 discloses:
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> A network address translation system (fig. 5) for isolating internal IP traffic from external IP traffic in the Inter-Working Function of a Global System for Mobile Communications network (Fig. 5, 301), comprising:
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> network means for interconnecting (Fig. 5, Ethernet Switch 314) an Inter-Working Function Protocol Engine (Fig. 5, 312) and an Inter-Working Function

Management System (Fig. 5, 311), located in said Inter-Working Function; and a network server for processing external IP traffic with an external data communication network (Fig. 5, L2TP server 303)

external IP address means for additionally assigning selected ones of said ports of said Inter-Working Function Protocol Engine with a public IP address for access from a source located external to said Inter-Working Function (321, since the address has been assigned, means for assigning are inherent, the selected group consists of all ports within the IWF);

L2TP network server means (303) connected to said network means (314) for interconnecting said network means with the Internet. (Fig. 5)

Admitted prior art Figure 5 discloses all of the limitations of claims 1-3 and 5-7 except for internal IP address means, routing means, and address means for appending.

Regarding the missing limitations, Bhatia teaches:

internal IP address means for assigning a port of said Inter-Working Function Protocol Engine with a private IP address for use exclusively on said network means; (Col. 11, lines 59-62 state that LAN modem 300 assigns a private address to both terminals 10e and 10f)

routing means for assigning a one of said private and public IP addresses to data transmissions received at said network means and associated with said port of said Inter-Working Function Protocol Engine. (Col. 12, lines 10-25 describe the routing means that assign IP addresses to data transmissions received.)

address means for appending said assigned public IP address to said data transmission as a source address when said port of said Inter-Working Function Protocol Engine is a source of said data transmission to said L2TP network server means. (Col. 12, lines 17-23 discloses that packets heading to the ISP have their address changed (appended) to use the public IP address.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the admitted prior art of Figure 5 to include the use of the IP address means, routing means and address means of Bhatia in order to significantly reduce time and costs associated with establishing, configuring and using a LAN for a workgroup as well as with connecting each client therein to a remote network server provider. (Bhatia, Col. 4, lines 27-30)

Applicants' network address translation system operates in a Global System for Mobile Communications network and isolates internal IP traffic from external IP traffic in the Inter-Working Function (IWF) of a Global System for Mobile Communications network by assigning dual IP addresses for every port of the Inter-Working Function Protocol Engine. The Inter-Working Function Protocol Engine includes one or more Ethernet Ports, each of which is assigned a private IP address, to connect the Inter-Working Function Protocol Engine to the Ethernet Switch as well as a public IP

address of the customer's network used to connect the Inter-Working Function Protocol Engine to L2TP Network Server. The addresses are static; therefore, every port has both a public IP address and a private IP address which are used to enable access from external to the network and internal to the network, respectively. These addresses are selectively used as defined in Applicants' independent claims:

> … appending said assigned public IP address to said data transmission as a source address when said port of said Inter-Working Function Protocol Engine is a source of said data transmissions for transmission to said network server, and for appending said assigned private IP address to said data transmission as a source address when said port of said Inter-Working Function Protocol Engine is a source of said data transmissions for transmission to said Inter-Working Function Management System …

Thus, each port can use its unique private/public IP address as a function of the destination of the data transmission, with a return message being directed to this IP address, thereby preventing sites external to the Inter-Working Function from accessing the private IP addresses.

Existing wireless network configurations isolate internal IP traffic from external IP traffic in the Inter-Working Function (IWF) of a Global System for Mobile Communications network, but not via the use of dual IP addresses for every port in the Inter-Working Function Protocol Engine. In particular, the Inter-Working Function is used to process both customer-based Internet traffic and Operations, Administration, Maintenance, and Provisioning functions; and these functions should not be accessible via a public Internet address while the customer-based Internet presence is accessible via a public Internet address. Existing systems use both hardware and software to separate the two types of IP traffic within the Inter-Working Function (IWF) of a Global System for Mobile Communications network, as shown in the prior art of Applicants' Figures 3 – 5; however, none of these show or suggest a system where each port can use its unique private/public IP address as a function of the destination of the data transmission, with a return message being directed to this IP address, thereby preventing sites external to the Inter-Working Function from accessing the private IP addresses.

The cited Bhatia Patent discloses an ISDN LAN modem that is suited for small user environments and which contains an internal ISDN router having a self-contained network hub for inter-connecting multiple network devices, such as workstations, to each other through a local area network, and for permitting each of those devices to each gain access through the router to any one of

a number of different remote networks. The LAN modem communicates network failure messages to a host workstation connected to the LAN by intercepting and responding to various DNS (domain name system) messages issued by that workstation and intended for a remote DNS server. Specifically, the LAN modem supplies its own network (IP) address in response to these messages, thus assuming a role of both a remote DNS server and a remote web server in order to implement a mechanism through which a fault-specific web page can be dynamically constructed and downloaded to the workstation for subsequent display through a browser executing thereat. The page, once rendered, provides a specific message pertinent to the failure.

The use of IP addresses is described in the Bhatia Patent, column 5, line 18 to column 6, line 8 (emphasis added):

> Specifically, **the LAN modem assigns a private IP address to each workstation that connects to the LAN**. **The LAN modem translates the individual private IP address of each of the workstations to a single public address assigned**, e.g., either statically or dynamically, to the LAN modem by a network service provider, e.g., an Internet service provider (ISP), by accessing a source-based routing table and a host list which collectively associate the private source IP address of a particular workstation on the LAN and a network ID for the service provider to which that workstation is ultimately connected through the LAN modem. The LAN modem also translates source and destination port number fields, as needed. This IP address and port number translation assures uniqueness of a set of source/destination IP addresses, protocol ID and source/destination port numbers in packets that flow between unique client/server applications and which pass through the LAN modem so as to provide unambiguous routing in the LAN modem between all the workstations connected to the LAN modem and associated remote servers.
>
> Consequently, through such translation, then as far as the ISP is concerned, all packet traffic involving the **workstations, by virtue of their common, though shared, public IP address, appears to emanate from or be directed to a single user**. Appropriate account information, such as user identification and password data, for the shared account is stored within the shared database in the LAN modem. Through this information, the LAN modem transparently establishes the connection between the workstations and the ISP without prompting any of the actual users therefor for appropriate account information. As a result of employing this inventive translated addressing technique, the LAN modem distributes (effectively de-multiplexing) individual packets emanating over a single ISDN connection from the ISP to the proper workstations on the LAN, and routes (i.e., effectively multiplexes) outgoing packets, from all such workstations having differing private IP addresses, into a common packet stream over a single shared packet connection to that ISP for

> subsequent transport over the remote network. Advantageously, by permitting multiple users to share a single ISP account, use of our inventive technique is likely to significantly reduce collective network access charges over what these users would otherwise incur if, as conventionally occurs, they were to gain network access through separate user accounts.
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> Furthermore, through use of the inventive hierarchical routing scheme, the LAN modem can simultaneously route packet traffic between multiple workstations on the LAN and different corresponding ISPs through different ISDN connections simultaneously existing between the LAN modem and those providers. In this regard, the LAN modem accommodates connections to several different user-definable network service providers, e.g., ISPs, by storing appropriate information for each such provider in a shared database, such as user account and password information, as well as network identification including network IP address, domain names and remote DNS server addresses, and employing this information to define the appropriate connections and properly route packets accordingly over these connections.

Thus, the Bhatia Patent **assigns each workstation only a private IP address and all workstations have to share a single public IP address.** There is no showing or even a hint that each workstation can have both a unique private IP address and a unique public IP address. This architecture is further described in column 11, line 24 to column 12, line 43 (emphasis added):

> In establishing the ISDN connection, the LAN modem can be configured to utilize multi-link PPP (point-to-point protocol) in establishing the connection. Assuming this protocol is supported by the service provider, then, based on the amount of packet traffic which is to be carried over the connection at any time and hence the required transmission bandwidth therefor, either one or, as shown, both B channels (B.sub.1 and B.sub.2 for a total available bandwidth of 128 Kbits/second) will be used to carry this traffic, via ISDN lines 40 and 58, among LAN modem 300, PSTN 50 and the service provider (not specifically shown) for remote network 60. Through use of multi-link PI)P, the number of B channels that carry this traffic at any one time will dynamically vary between one and two based on traffic loading then occurring. LAN modem 300 can also be configured to dynamically assign an available IP address within the subnet assigned to the LAN modem (hence providing dynamic IP addressing) to each of the workstations as a corresponding user, i.e., User.sub.1, User.sub.2, User.sub.3 or User.sub.4, logs onto the LAN network.
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> Alternatively, as noted above and depicted in FIG. 2B, LAN modem 300 can provide two simultaneous connections for two different workstations in the LAN, over separate B-channels (each providing 64 Kbits/second of bandwidth) of a common ISDN connection, to different corresponding remote networks. Here, assume that within a workgroup, User.sub.5 and User.sub.6 stationed at respective workstations 10.sub.e and 10.sub.f have different user accounts at different ISPs (Internet service

providers), here symbolized by remote networks 60 and 70, respectively, and desire to access the Internet during the same time through these different ISPs.

Illustratively, for User.sub.5 and User.sub.6, LAN modem 300 will establish a single B-channel connection, as symbolized by line 58, over B-channel B.sub.1, to remote network 60, and as symbolized by line 55, over B-channel B.sub.2, to remote network 70, respectively.

Furthermore, in this scenario, as each user logs onto the LAN through a corresponding workstation (10.sub.e or 10.sub.f), LAN modem 300 dynamically assigns an available private IP address to the workstation for that user. Accordingly, workstations 10.sub.e and 10.sub.f are assigned private IP addresses 192.168.1.2 and 192.168.1.4, respectively; with LAN modem 300 having private IP address 192.168.1.1. The LAN modem maintains a list of private IP addresses available for local use by workstations (or other networked devices) connected to the LAN. None of these private addresses is ever routed beyond the LAN. As the user logs onto the LAN and establishes a connection through LAN modem 300 to his(her) ISP, that ISP will dynamically assign an IP address to that user. The dynamic public IP addresses assigned to User.sub.5 and User.sub.6 are, e.g., 210.7.12.1 and 234.12.63.15, respectively. Each of the dynamic IP addresses will be stored within the LAN modem (particularly within a shared database therein as discussed below in detail). As incoming packets containing these dynamic IP addresses are routed by the ISPs, over the different B channels, to LAN modem 300, the LAN modem, in essence, will translate the dynamic public IP address contained in each such packet to the private IP address of the corresponding workstation and route the packet, but containing the translated address as the destination IP address, to the LAN. Similarly, for packets appearing on the LAN which, based on their destination IP addresses, are to be routed by the LAN modem to either of the ISPs, the LAN modem, in essence, will translate the source IP address in each of these packets from the private IP address into the appropriate public dynamic IP address of the associated workstation, substitute the translated IP address for the private IP address in each such packet, and then route that packet accordingly to the proper remote network. Though this scenario has been described as using dynamic IP addressing for both of the workstations, i.e., with addresses being dynamically assigned by both the remote networks involved and the LAN modem, one or both of the workstations can alternatively be statically addressed using fixed public IP addresses. Moreover, though this example depicts merely one workstation connected to each ISP, the LAN modem, as will be clear in conjunction with the scenario depicted in FIG. 2C, can share a common connection to an ISP across multiple workstations.

In addition, as noted above and depicted in FIG. 2C, LAN modem 300 can provide simultaneous access for any or all workstations in the LAN to a common service provider, such as a single ISP, through a single account. Here, assume that within a workgroup, illustratively User.sub.7, User.sub.9 and User.sub.10 respectively stationed at workstations 10.sub.g, 10.sub.i and 10.sub.j all desire to access, e.g., the Internet through a single user account at a common ISP, here symbolized by remote network 60.

Thus, the Bhatia Patent fails to show or even hint that each workstation can have both a unique private IP address and a unique public IP address as a function of the destination of the data transmission, with a return message being directed to this IP address, thereby preventing sites external to the Inter-Working Function from accessing the private IP addresses.

The Warrier Publication discloses a system for sending a data packet through a network. The network has public and private realms separated by an interface device. A client in the private realm performs the method. The method includes determining if a destination address of the data packet corresponds to the private realm or to the public realm and retrieving a source address for the client based on the destination address of the packet. The method also includes assigning a retrieved address to be the source address of the data packet.

Applicants' independent claims recite the assignment of private IP addresses to all of the ports of the Inter-Working Function Protocol Engine for use exclusively in communicating with the Inter-Working Function Management System and concurrently assigning public IP addresses to ports of the Inter-Working Function Protocol Engine, on the same side of a network, for communicating with destinations external to the system. The prior art teaches that all devices on one side of the network are assigned private IP addresses, and those on the other side of the network are assigned public IP addresses.

In view of the above amendments and remarks, Applicants believe the pending application is in condition for allowance. Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 50-1848, under Order No. 013436.0278PTUS from which the undersigned is authorized to draw.

Respectfully submitted,
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